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10/521,161

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EXAMINER

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Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/521,161
Filing Date: January 03, 2005
Appellant(s): LEFFER, HANS GEORG

Craig M. Lundell
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 15, 2010 appealing from the Office action mailed February 2, 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:
1, 2, 5, 6, 9, 10 and 12-14.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,789,528	Owen et al.	12-1988
5,266,281	Kao et al.	11-1993
3,968,653	Cachera	7-1976
4,279,830	Haag et al.	7-1981

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, 5, 6, 10, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Owen et al. (4,789,528) in view of Kao et al. (US Patent No. 5,266,281)**.

Regarding Claim 1, Owen et al. reference discloses a reactor system suitable for carrying out exothermic chemical reactions comprising

one or more common reactant feed lines fed into two or more single unit operated reactors which are to be operated as one single unit wherein each reactor comprises a separated, individual reactor (**Figure 1, numeral 51- reactor feed header and numerals 10, 20, 30 and 40 – reactors**), the reactors having one or more common product discharge lines (**Figure 1, numeral 39 – reactor effluent**).

Owen et al. reference also discloses a heat exchange system (**Figure 1, numeral 19**) for cooling the reactor effluent. However, Owen et al. does not disclose

that each reactor comprises a multitubular fixed bed catalyst arrangement and each of the reactors comprises an indirect heat exchange system, which heat exchange systems are jointly operated to cool the reactors as if they were a single unit.

Kao et al. reference discloses a catalytic reactor comprising a multitubular fixed bed catalyst arrangement and an indirect heat exchange system (**Figure 1**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the multiubular catalytic reactor as taught by Kao et al. with the reactor of Owen et al., since Kao et al. states at **Abstract** that such a modification would produce high purity products due to the improvement in thermal exchange.

Regarding Claim 2, Owen et al. and Kao et al. references disclose the reactor system of claim 1 comprising between 3 and 8 single unit operated reactors (**Owen et al. - Figure 1, numerals 10, 20, 30 and 40**).

Regarding Claim 5, Owen et al. and Kao et al. references disclose the reactor system of claim 1 comprising one common gas reactant feed line (**Owen et al. - Figure 1, numeral 51- reactor feed header**).

Regarding Claim 6, Owen et al. and Kao et al. references disclose the reactor system of claim 1 comprising one common gas product discharge line (**Owen et al. - Figure 1, numeral 39 – reactor effluent – gas product is intended use of the apparatus**).

Regarding Claim 10, Owen et al. and Kao et al. references disclose the reactor system of claim 1 comprising four single unit operated reactors (**Owen et al. - Figure 1, numerals 10, 20, 30 and 40**).

Regarding Claim 13, Owen et al. and Kao et al. references disclose the reactor system of claim 1 comprising one common liquid product discharge line (**Owen et al. - Figure 1, numeral 39 – reactor effluent – liquid product is intended use of the apparatus**).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Owen et al. (4,789,528) in view of Kao et al. (US Patent No. 5,266,281) and Cachera (US Patent No. 3,968,653)**.

Regarding Claim 12, Owen et al. and Kao et al. references disclose the reactor system of claim 1 except for the heat exchange system that comprises a thermosiphon system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the thermosiphon heat exchange as taught by Cachera with the heat exchange system of Owen et al., since Cachera states at **Column 1, Lines 62-68** that such a modification would provide a fair degree of reliance on natural circulation of the primary cooling medium by using thermosiphon.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kao et al. (US Patent No. 5,266,281) in view of Owen et al. (4,789,528)**.

Regarding Claim 9, Kao et al. reference discloses a process for the preparation of hydrocarbons by reaction of carbon monoxide and hydrogen in the presence of a

catalyst at elevated temperature and pressure in a single multitubular catalytic reactor wherein the reactor comprises an indirect heat exchange system for cooling the reactor **(Abstract and Figure 1)**.

However, Kao et al. does not disclose wherein the reactor system comprises one or more common reactant feed lines fed into two or more single unit operated reactors which are operated as one single unit, each reactor comprising a multitubular fixed bed catalyst arrangement, the reactors having one or more common product discharge lines.

Owen et al. reference discloses a reactor system comprising one or more reactors having one or more common reactant feed lines and one or more common product discharge lines wherein the product effluent is cooled by an indirect heat exchange system **(Figure 1, numerals 51, reactor feed header, 10, 20, 30 and 40 – reactors and 39 - reactor effluent)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to operate the process of Kao et al. using the multi reactor system as taught by Owen et al., since Owen et al. states at **Column 1, Lines 28-41** that such a modification would be more economical than using one very large reactor.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Kao et al. (US Patent No. 5,266,281) in view of Owen et al. (4,789,528) and Haag et al. (US Patent No. 4,279,830)**.

Regarding Claim 14, Kao et al. and Owen et al. references disclose the process of claim 9 except for the catalyst that comprises a cobalt catalyst.

Haag et al. reference discloses a process for the preparation of hydrocarbons by reaction of carbon monoxide and hydrogen in the presence of cobalt catalyst at elevated temperature and pressure (**Abstract and Column 1, Lines 39-42**).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the cobalt as the catalyst for producing methanol, since Haag et al. reference states at **Column 1, Lines 39-42** that cobalt catalyst is well known for use in converting synthesis gas (carbon monoxide and hydrogen) to hydrocarbon mixtures.

(10) Response to Argument

Appellant's arguments filed July 15, 2010 have been fully considered but they are not persuasive.

Regarding Claims 1 and 9, appellant argues that the term "single unit operated reactors" means that all of the individual, separated reactors are operated in parallel (**Specification – Page 5**) as if they were a single large reactor while Owen et al. is directed to a technique for sequential rotation of reactors in a multi-reactor catalytic conversion system. Accordingly, the claimed system is designed such that the reactors are operated in parallel, not in series as is the Owen system. Examiner disagrees with this assessment since the Owen system, which comprises valves (i.e. 49, 53, 55, and 57...) for independently opening/closing based on the intended use of the device, is capable of operating in **parallel** even though the Owen system is being used in a process in series. Also, there is no evidence that the system of Owen cannot be used as a single large reactor unit since it is a continuous process.

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(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Huy-Tram Nguyen/
Examiner, Art Unit 1797

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797

Conferees:

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